

Docket No.: 60382-USA  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

---

In re Patent Application of:  
Christopher J. Sewall et al.

Application No.: 10/824,688

Art Unit: 1623  
Conf No.: 8069

Filed: April 14, 2004

Examiner: Everett White

For: HOMOGENEOUS, THERMOREVERSIBLE  
GEL CONTAINING REDUCED VISCOSITY  
CARRAGEENAN AND PRODUCTS MADE  
THEREFROM

---

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**APPEAL BRIEF UNDER 37 CFR § 41.37**

This Appeal Brief is being filed in response to the final rejection dated February 4, 2009. A Notice of Appeal was filed on July 1, 2009. A one month extension of time is requested making the one month extended deadline October 1, 2009. Please charge any fees necessitated by this Appeal Brief to Deposit Account No. 06-1440. Reconsideration and reversal of the outstanding rejection is respectfully requested. .

**I. Real Party in Interest**

The real party in interest in regard to this patent application and appeal is FMC Corporation by virtue of an assignment recorded on August 16, 2006 at reel 018116, frame 0642.

## **II. Related Appeals and Interferences**

There are no other appeals, interferences or judicial proceedings that may be related to, directly affect, be directly affected by or have a bearing on the Board's decision in this appeal.

### **III. Status of Claims**

Claims 1-45 were originally filed in the present application. Claims 1-28 are pending and subject to this appeal, and claims 29-45 are cancelled.

#### **IV. Status of Amendments**

An amendment to the claims was filed in a Response to Office Action (“Response”) dated July 1, 2009 (after receipt of the final rejection dated February 4, 2009). In the Advisory Action dated July 22, 2009, the Examiner noted that the amendments to the claims set forth in the Response will be entered for purposes of appeal.

**V. Summary of Claimed Subject Matter**

Claims 1-28 are pending and subject to this appeal. Claim 1 is the only independent claim among claims 1-28. As set forth in claim 1, the present invention is directed to a homogeneous, thermoreversible gel comprising carrageenan (e.g., see the present specification at page 3, lines 2-3, from the bottom), wherein said carrageenan has a viscosity of 5 to less than 10 cP (e.g., see the present specification at page 7, line 9, from the bottom) at 75 °C when measured in a 0.10 molar aqueous sodium chloride solution containing 1.5% by weight of said carrageenan based on the weight of all components in said solution (e.g., see the present specification at page 7, lines 6-9, from the bottom), and optionally at least one of a plasticizer, a second film former, a bulking agent, and a pH controlling agent (e.g., see the present specification at page 4, lines 2-3), wherein said gel has a solids content of at least 40% (e.g., see the present specification at page 4, line 3) and said carrageenan is present in an amount of at least 70% of all carrageenan present in said gel (e.g., see the present specification at page 30, lines 7-8).

In high solids systems, for example, greater than 40% solids, carrageenan gel forming compositions have been known to create highly viscous systems that create processing problems when the gel is made, e.g., such processing requires significant heat, shear, handling in order to prevent premature gelling or formation of gels and gel films that are less than fully homogeneous (resulting in gels of weaker strength) (e.g., see the present specification at page 3, lines 6-10). Important industrial applications, such as the manufacture of soft capsules, hard capsules, edible products (gummies, candies, etc.), solid forms encapsulating powders, tablets, etc., could benefit

from the use of particular carrageenan gels that gel at reduced temperatures (e.g., see the present specification at page 3, lines 10-13). It has long been believed that the gelling temperature of carrageenan is independent of its molecular weight (e.g., see the present specification at page 3, lines 13-15). To Appellants' surprise, in high solids carrageenan gels, such as at least 40% solids, the gels and gel films containing reduced molecular weight carrageenans as referenced herein result in a highly desirable lowering of the gelling temperature (e.g., see the present specification at page 3, lines 15-18).

**VI. Grounds of Rejection to be Reviewed on Appeal**

There is one outstanding rejection of pending claims 1-28, and this rejection is the subject matter of this appeal. That is, at pages 3-4 of the final rejection dated February 4, 2009, the Examiner rejected claims 1-28 under 35 USC § 103 as being unpatentable over Jonsson (US 6,967,037) in view of Guiseley (US 4,443,486).



## **VII. Argument**

At pages 3-4 of the final rejection dated February 4, 2009, the Examiner rejected claims 1-28 under 35 USC § 103 as being unpatentable over Jonsson (US 6,967,037) in view of Guiseley (US 4,443,486). The Examiner's position is essentially that Jonsson discloses a food composition in the form of a gel comprising soluble solids in the range of about 50% to about 90 % by weight and a carrageenan component present in an amount sufficient to gel. The Examiner indicates that the gel of the present invention (claiming the viscosity of the carrageenan to be 5 to less than 10 cP) is not disclosed in Jonsson. However, the Examiner asserts that Guiseley discloses the use of carrageenans having the presently claimed viscosity in milk products. Therefore, the Examiner argues that it would have been obvious to combine the teachings of Jonsson with the teachings of Guiseley since both patents disclose carrageenan in the presence of food compositions.

### **1. Jonsson Fails to Disclose the Presently Claimed Carrageenan**

Jonsson is directed to the stated problem of overcoming the limited solubility of using carrageenan in high solids systems for food compositions. More specifically, the Jonsson invention is directed to food compositions comprising soluble solids in the range of 50% to 70% by weight, at least 70% by weight thereof being a sweetening system comprising sucrose and non-sucrose sweeteners. Jonsson discloses that the use of such a sweetening system surprisingly allows the carrageenan component to be dissolved in a high solids system.

Importantly, Jonsson discloses that “...any carrageenan component, which will provide the required gelling capability, may be employed in a food composition according to the present invention” (emphasis added; see col. 6, lines 42-44).

The Examiner admits that Jonsson does not disclose the gel of the present invention having a carrageenan possessing the claimed viscosity. As a result, the Examiner relies on Guiseley for this teaching.

**2. Guiseley Expressly Teaches Away from the Use of the Presently Claimed Carrageenan in a Gel**

The Examiner relies on Guiseley as suggesting the use of the presently claimed carrageenan in the teachings of Jonsson. As noted above, Jonsson teaches that the carrageenans useful therein are those that “will provide the required gelling capability” (see col. 6, lines 42-44).

However, Appellants explain that Guiseley discloses and suggests the exact opposite. That is, Guiseley discloses that the low molecular weight carrageenan extract of the Guiseley invention is used as a stabilizer for chocolate milk because such carrageenan will not lead to gelation. Guiseley states:

One such performance advantage...of the modified *Euchema Cottonii* extractive of this invention is its ability to provide stabilization of chocolate milk at relatively high use levels without excessive thickening of the product...This characteristic of the modified extractive of this invention is of particular importance in those circumstances where the chocolate milk is subjected to

extreme shear stresses during processing, and the dairyman wishes to provide stabilization without running the risk of gelation, as is encountered when using a more conventional stabilizer at a high enough level to accommodate for the effects of shear stresses” (see col. 5, lines 29-42; emphasis added).

Therefore, the carrageenan materials of the Guiseley invention are specifically disclosed as being useful therein because they would NOT lead to gelation.

In contrast, the present invention is directed to a homogeneous, thermoreversible gel comprising carrageenan wherein the carrageenan has a viscosity of 5 to less than 10 cP (at 75 °C when measured in a 0.10 molar aqueous sodium chloride solution containing 1.5% by weight of the carrageenan based on the weight of all components in the solution). As a result, one skilled in the field would NOT have been motivated to use the carrageenans from Guiseley (disclosed to be useful because they would not lead to gelation) in the teachings in Jonsson (which discloses the use of carrageenans having sufficient gelation in high solids food compositions).

As previously explained, to Appellants’ surprise, in high solids carrageenan gels, such as at least 40% solids, the gels and gel films containing reduced molecular weight carrageenans of the present invention result in a highly desirable lowering of the gelling temperature. The gelling temperature is significantly reduced in such gels as shown at pages 8-10 of the specification. Lower gelling temperatures of the gels considerably benefits processing of the gels and overcomes problems associated with high gelling temperatures. Nothing in Jonsson or Guiseley, alone or together, discloses or suggests lowering of the gelling temperatures of homogeneous, thermoreversible gels having a high solids content (of at least 40%) by using the reduced

molecular weight carrageenan in accordance with the present claims (see the present specification at pages 8-10 and the present examples).

At page 3 of the final rejection dated February 4, 2009, the Examiner notes Appellants' argument above, but does not appear to completely address it or the full teachings of Guiseley. Appellants fully understand that the Examiner is citing Guiseley "to show that the viscosity values of the carrageenan recited in the instant claims are known in the art" (see page 3, paragraph 5, thereof). However, it does not appear that the Examiner has fully addressed Appellant's comments about the full teachings in Guiseley; namely, that Guiseley expressly teaches the use of the carrageenans disclosed therein in applications where gelation is to be avoided. As a result, one skilled in the field would not be motivated to combine the references as suggested by the Examiner since the full teachings of Guiseley expressly teach away from using the carrageenans disclosed therein in applications requiring gelation such as Jonnson. Moreover, it is respectfully submitted that Guiseley actually supports the unexpected nature of the presently claimed invention.

### **3. The Examiner's comments in the Advisory Action**

The Examiner notes in the Advisory Action that the instant claims include up to 30% of carrageenans that do not fall within the instantly claimed viscosity of 5 to less than 10 cP. The Examiner's point here is not entirely understood and is believed to confuse what is required to establish a proper *prima facie* case of obviousness. That is, the present invention comprises up

to 70% of the carrageenan having the claimed viscosity range. Neither reference, alone or in any combination, suggests the use of such carrageenan in a gel. (In fact, Guiseley, expresses teaches away from using the presently claimed carrageenan in a gel as discussed above.) The Examiner has not established that any reference or any combination of references teach or suggest each of the limitations in the present claims (as is required to establish a proper *prima facie* case of obviousness), and the Examiner's reference in the Advisory Action to other possible carrageenans that may be included does not somehow cure this deficiency.

#### **4. Conclusion**

In view of the above, Appellants' respectfully submit that the present invention is unobvious and patentable over Jonsson in view of Guiseley.

Reconsideration and reversal of the rejection is respectfully requested.

Dated: September 30, 2009

Respectfully submitted,

By: /Paul A. Fair, Reg. No. 35,866/  
Paul A. Fair, Esq.  
Registration No.: 35,866  
215-299-6723

Appeal Brief  
Application No.: 10/824,688

Docket No.: 60382-USA

Please forward all correspondence to:

Patent Administrator  
FMC Corporation  
1735 Market Street  
Philadelphia, PA 19103

### **VIII. Claims Appendix**

1. A homogeneous, thermoreversible gel comprising carrageenan wherein said carrageenan has a viscosity of 5 to less than 10 cP at 75 °C when measured in a 0.10 molar aqueous sodium chloride solution containing 1.5% by weight of said carrageenan based on the weight of all components in said solution, and optionally at least one of a plasticizer, a second film former, a bulking agent, and a pH controlling agent, wherein said gel has a solids content of at least 40% and said carrageenan is present in an amount of at least 70% of all carrageenan present in said gel.
2. The gel of claim 1, wherein said carrageenan is at least one of iota carrageenan, kappa carrageenan or kappa-2 carrageenan.
3. The gel of claim 2, wherein said carrageenan is at least 80% by weight iota carrageenan based on the total weight of all carrageenan in the gel and the gel has a gelling temperature of 60 °C or less.
4. The gel of claim 2, wherein said carrageenan is at least 80% by weight kappa carrageenan based on the total weight of all carrageenan in the gel and the gel has a gelling temperature of 30 °C or less.

5. The gel of claim 2, wherein said carrageenan is at least 80% by weight kappa-2 carrageenan based on the total weight of all carrageenan in the gel and the gel has a gelling temperature of 35 °C or less.
6. The gel of claim 1, wherein said viscosity is from 5 to 8 cP.
7. The gel of claim 1, wherein said carrageenan is the only carrageenan in the gel.
8. The gel of claim 1, wherein said gel contains a plasticizer.
9. The gel of claim 1, wherein said carrageenan contains at least one of calcium, potassium, magnesium, ammonium or sodium cation.
10. The gel of claim 9, wherein said cation is at least 75% by weight sodium based on the total cation content.
11. The gel of claim 9, wherein said cation is at least 85% by weight sodium based on the total cation content.
12. The gel of claim 9, wherein said cation is at least 90% by weight sodium based on the total cation content.



13. The gel of claim 9, wherein said cation is at least 95% by weight sodium based on the total cation content.
14. The gel of claim 9, wherein said cation is at least 98% by weight sodium or potassium or combination thereof based on the total cation content.
15. The gel of claim 1, wherein said carrageenan is present in an amount of from 0.5% to 25% by weight of the gel.
16. The gel of claim 1, wherein said carrageenan is present in an amount of from 0.5% to 15% by weight of the gel.
17. The gel of claim 1, wherein said solids content is at least 50%.
18. The gel of claim 1, wherein said solids content is at least 60%.
19. The gel of claim 1, wherein said solids content is at least 70%.
20. The gel of claim 1, wherein said solids content is at least 80%.
21. The gel of claim 1, wherein said solids content is at least 90%.

22. The gel of claim 1, wherein said carrageenan is present in an amount of at least 40% of the total dry weight of film formers in the gel.

23. The gel of claim 1, wherein said carrageenan is present in an amount of at least 80% of the total dry weight of film formers in the gel.

24. The gel of claim 1, wherein said carrageenan is the only film former present in the gel.

25. The gel of claim 1, wherein said second film former is selected from the group consisting of starch, starch derivative, starch hydrozylate, cellulose gums, alginates, propylene glycol alginate, polymannan gums, dextran, pectin, gellan, pullulan, alkylcellulose ethers, modified alkyl cellulose ethers and at least one carrageenan having a viscosity of 10 cP or more at 75 °C when measured in a 0.10 molar aqueous sodium chloride solution containing 1.5% by weight of said carrageenan based on the weight of all components in said solution.

26. The gel of claim 1, wherein said plasticizer is at least one member selected from the group consisting of glycerin, sorbitol, polydextrose, maltitol, lactitol, and polyalkylene glycols; said second film former is at least one member selected from the group consisting of a starch, starch derivative, starch hydrozylate, cellulose gum, hydrocolloid, an alkylcellulose ether and a modified alkyl cellulose ether; and said bulking agent is at least one member selected from the group consisting of microcrystalline cellulose, microcrystalline starch, starch, starch derivatives, inulin, starch hydrozylates and polydextrose.

27. The gel in any of claims 1-26, wherein said gel is a gel film.
28. An edible product comprising the gel in any of claims 1-26.

**IX. Evidence Appendix**

None.

**X. Related Proceedings Appendix**

None.